

Appl. No. 09/942,459

Request for Reconsideration of April 23, 2004

Reply to the Advisory Action of February 26, 2004

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A method for controlling an output frequency of a laser, said method comprising:

passing optical energy from an output of said laser to an optical component having a frequency-selective response characteristic;

measuring response of said optical component having said frequency-selective response characteristic to said optical energy from said laser output using exactly one photodetector; and

controlling said laser output frequency based on said measured response by generating an error signal based on a difference between a measured laser output frequency and a desired laser output frequency and generating a control signal for said laser output frequency based on a sum of said error signal and a dithering signal; and

if said measured response indicates said laser output frequency is outside a tracking range, sweeping a said control signal until said laser output frequency is within said tracking range.

Claim 2 (cancelled)

Claim 3 (currently amended): The method of claim 3 ~~1~~ wherein generating an error signal comprises:

sampling said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency;

sampling said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency; and

developing said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Appl. No. 09/942,459  
Request for Reconsideration of April 23, 2004  
Reply to the Advisory Action of February 26, 2004

Claim 4 (original): The method of claim 1 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Claim 5 (cancelled)

Claim 6 (previously presented): A method for controlling an output frequency of a laser, said method comprising:

passing optical energy from an output of said laser to an optical component having a frequency-selective response characteristic;

measuring response of said optical component having said frequency-selective response characteristic to said optical energy from said laser output;

generating a dithering signal to dither said output frequency of said laser; and

controlling said laser output frequency based on said measured response as influenced by said dithering signal; and

if said measured response indicates said laser output frequency is outside a tracking range, sweeping a control signal until said laser output frequency is within said tracking range.

Claim 7 (original): The method of claim 6 wherein controlling said laser output frequency comprises:

generating an error signal based on a difference between a measured laser output frequency and a desired laser output frequency; and

generating a control signal for said laser output frequency based on said error signal and said dithering signal.

Claim 8 (original): The method of claim 7 wherein generating an error signal comprises:

sampling said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency;

Appl. No. 09/942,459

Request for Reconsideration of April 23, 2004

Reply to the Advisory Action of February 26, 2004

sampling said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency; and developing said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Claim 9 (original): The method of claim 6 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Claim 10 (cancelled)

Claim 11 (original): The method of claim 6 wherein said dithering signal comprises a square wave.

Claim 12 (currently amended): Apparatus for controlling an output frequency of a laser, said apparatus comprising:

an optical component having a frequency-selective response characteristic, said optical component receiving optical energy from said laser;

exactly one photodetector that measures response of said optical component having said frequency-selective response characteristic to said optical energy from said laser output;

a control block that controls said laser output frequency based on said measured response, wherein said control block comprises:

an error signal generator that generates an error signal based on a difference between a measured laser output frequency and a desired laser output frequency; and

a control signal generator that generates a control signal for said laser output frequency based on said error signal and a dithering signal; and

a sweep generator that, if said measured response indicates said laser output frequency is outside a tracking range, sweeps a said control signal until said laser output frequency is within a tracking range.

Appl. No. 09/942,459  
Request for Reconsideration of April 23, 2004  
Reply to the Advisory Action of February 26, 2004

Claim 13 (cancelled)

Claim 14 (previously presented): The apparatus of claim 12 wherein said error signal generator samples said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency, samples said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency, and develops said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Claim 15 (original): The apparatus of claim 12 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Claim 16 (cancelled)

Claim 17 (previously presented): Apparatus for controlling an output frequency of a laser, said apparatus comprising:

- an optical component having a frequency-selective response characteristic that receives optical energy from said laser;

- a photodetector that measures response of said optical component having said frequency-selective response characteristic to said optical energy from said laser;

- a dithering signal generator that dithers said output frequency of said laser; and

- a control block that controls said laser output frequency based on said measured response as influenced by said dithering signal; and

- a sweep generator that, if said measured response indicates said laser output frequency is outside a tracking range, sweeps a control signal until said laser output frequency is within said tracking range.

Appl. No. 09/942,459  
Request for Reconsideration of April 23, 2004  
Reply to the Advisory Action of February 26, 2004

Claim 18 (original): The apparatus of claim 17 wherein said control block comprises:

an error signal generator that generates an error signal based on a difference between a measured laser output frequency and a desired laser output frequency; and  
a control signal generator that generates a control signal for said laser output frequency based on said error signal and said dithering signal.

Claim 19 (original): The apparatus of claim 18 wherein said error signal generator samples said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency, samples said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency, and develops said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Claim 20 (original): The apparatus of claim 17 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Claim 21 (cancelled)

Claim 22 (original): The method of claim 17 wherein said dithering signal comprises a square wave.

Claim 23 (currently amended): Apparatus for controlling an output frequency of a laser, said apparatus comprising:

means for passing optical energy from an output of said laser to an optical component having a frequency-selective response characteristic;

means for measuring response of said optical component having said frequency-selective response characteristic to said optical energy from said laser output using exactly one photodetector;

Appl. No. 09/942,439

Request for Reconsideration of April 23, 2004

Reply to the Advisory Action of February 26, 2004

means for controlling said laser output frequency based on said measured response by generating an error signal based on a difference between a measured laser output frequency and a desired laser output frequency generating a control signal for said laser output frequency based on a sum of said error signal and a dithering signal; and

means for, if said measured response indicates said laser output frequency is outside a tracking range, sweeping a said control signal until said laser output frequency is within said tracking range.

Claim 24 (cancelled)

Claim 25 (previously presented): The apparatus of claim 23 wherein said means for generating an error signal comprises:

means for sampling said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency;

means for sampling said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency; and

means for developing said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Claim 26 (original): The apparatus of claim 23 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Claim 27 (cancelled)

Claim 28 (previously presented): Apparatus for controlling an output frequency of a laser, said apparatus comprising:

means for passing optical energy from an output of said laser to an optical component having a frequency-selective response characteristic;

Appl. No. 09/942,459  
Request for Reconsideration of April 23, 2004  
Reply to the Advisory Action of February 26, 2004

means for measuring response of said optical component having said frequency-selective response characteristic to said optical energy from said laser output;

means for generating a dithering signal to dither said output frequency of said laser;

means for controlling said laser output frequency based on said measured response as influenced by said dithering signal; and

means for, if said measured response indicates said laser output frequency is outside a tracking range, sweeping a control signal until said laser output frequency is within said tracking range.

Claim 29 (original): The apparatus of claim 28 wherein said means for controlling said laser output frequency comprises:

means for generating an error signal based on a difference between a measured laser output frequency and a desired laser output frequency; and

means for generating a control signal for said laser output frequency based on said error signal and said dithering signal.

Claim 30 (original): The apparatus of claim 29 wherein said means for generating an error signal comprises:

means for sampling said measured response at a first sampling time during a period that said dithering signal causes an upward fluctuation in said laser output frequency;

means for sampling said measured response at a second sampling time during a period that said dithering signal causes a downward fluctuation in said laser output frequency; and

means for developing said error signal based on a difference between samples recorded at said first sampling time and said second sampling time.

Claim 31 (original): The apparatus of claim 28 wherein said optical component having a frequency-selective response characteristic comprises a fiber Bragg grating having a notch frequency substantially equivalent to a desired output frequency of said laser.

Appl. No. 09/942,459

Request for Reconsideration of April 23, 2004

Reply to the Advisory Action of February 26, 2004

Claim 32 (cancelled)

Claim 33 (original): The apparatus of claim 28 wherein said dithering signal comprises a square wave.